

CLAIMS

1. Laser device comprising:

- an optical pumping means (10),

5 - an amplifying medium (2) excited by a laser beam (11) with a fundamental wavelength emitted by the optical pumping means, the output face (7) of this amplifying medium being cut according to the Brewster angle for said fundamental wavelength, and

10 - a birefringent crystal (4) for frequency doubling; characterized in that it also comprises an isotropic medium (3) inserted between the output face (7) of the amplifying medium and the input face (8) of the birefringent crystal, the amplifying medium (2) and the 15 birefringent crystal (4) being firmly attached to each other so as to constitute a monolithic resonant cavity; and in that the crystalline axis "c" of the birefringent crystal forms an angle θ_c which is not zero with respect to the orthogonal direction of the polarization of the 20 fundamental wave, defined by the Brewster surface.

2. Device according to claim 1, characterized in that the input face (8) of the birefringent crystal is cut according to a slight angle ε with respect to the normal 25 to the direction of propagation of the laser beam (5).

3. Device according to claim 1 or 2, characterized in that the output face (9) of the birefringent crystal is cut according to a slight angle ε with respect to the normal 30 to the direction of propagation of the laser beam (5).

4. Device according to claim 2 or 3, characterized in that the angle ε is less than or equal to one degree.

5. Device according to any one of the preceding claims, characterized in that the plane orthogonal to the direction of propagation of the fundamental wave contains the crystalline axis "c", this plane forming an angle
5 with respect to the "a" and "b" axes of the birefringent crystal so as to obtain a phase matching at the operating temperature between the fundamental wave and the harmonic wave.
- 10 6. Device according to any one of the preceding claims, characterized in that the amplifying medium (2) is constituted by yttrium aluminium garnet (YAG) doped with neodymium (Nd).
- 15 7. Device according to claim 6, characterized in that the amplifying medium (2) is a cylindrical Nd: YAG the input face of which constitutes a plane mirror.
- 20 8. Device according to any one of the preceding claims, characterized in that the pumping means (10) is a laser diode.
- 25 9. Device according to any one of the preceding claims, characterized in that the birefringent crystal (4) is made from potassium niobate (KNbO_3).
10. Device according to any one of the preceding claims, characterized in that the isotropic medium is the air.
- 30 11. Device according to any one of claims 1 to 9, characterized in that the isotropic medium is made from potassium tantalate (KTaO_3).
- 35 12. Device according to any one of claims 1 to 9, characterized in that the isotropic medium is constituted

by an isotropic crystal the refractive index of which is close to, for example within 10% of, the refractive index of the birefringent crystal.

- 5 13. Method used in a laser device according to any one of the preceding claims, characterized in that the optical path length covered by the laser beam is varied by translating the laser beam emitted by the pumping means with respect to the input face of the amplifier.